Abstract Submitted
for the SHOCK05 Meeting of
The American Physical Society

Procedure to study kinetics and topography of the glow induced by the HE explosion decomposition initiated by laser and electron beams[1]

V.T. GROMOV, A.V. PAVLENKO, V.L. STRYAKHNIN, O.V. NESTEROV, N.G. ORLOV, O.V. TKACHEV, B.G. LOBOIKO, V.P. FILIN, N.V. GARMASHEVA, RFNC-VNIITF, Snezhinsk — Development of new methods to investigate explosives (HE) behavior under external actions is still important. Recent years saw a principally new approach to this task. This approach is based on the experimental study of the early stages of explosion decomposition (pre-explosion processes) in real time (10^{-8} - 10^{-4} s). This paper describes the measurement facility and the procedure for studying the pre-explosion processes in high explosives based on pulse-radiolysis methods. In this procedure, the neodymium laser (pulse duration is 1.5 ps, 150 ps, and 15 ns; energy - up to 1.5 J) and the high-current accelerator of electrons (pulse duration is 50 ps and 6-20 ns, beam energy is 250 keV) were used as initiators of explosion decomposition. The procedure helps measure the amplitude-time parameters of acoustic signals generated during explosive decomposition of explosives, as well as the velocity of the sound and the profile of electron energy absorption in solid bodies including high explosives. Optical measurements were made with 0.1 ns time resolution, and 100 microns spatial resolution. The scheme based measures electric signals with the time resolution of 2 ns.

[1]This effort was supported by ISTC Project 2180

Valeriy P. Shukailo
RFNC-VNIITF, Snezhinsk

Date submitted: 23 May 2005 Electronic form version 1.4